General Notes.

GEOGRAPHY AND TRAVEL.

Alaska.—Mount St. Elias.—The scientific expedition sent out last spring under the joint auspices of the National Geographic Society and the United States Geological Survey, for the purpose of exploring the region about Mt. St. Elias, Alaska, has returned. Mr. Russell, who organized the expedition and had charge of the work, is now in Washington, and, at the request of the Associated Press, has furnished the following picturesque sketch of the work of his party:

The party consisted of Israel C. Russell, geologist; Mark B. Kerr, topographer, both members of the Geological Survey; E. F. Hosmer, general assistant; and seven camp hands, hired at Seattle, Washington, of whom J. H. Christie was foreman. Owing to uncertain health Mr. Hosmer returned home from the first camp. All arrangements for camping in an unknown country were completed at Seattle early in June, and on the 17th the expedition sailed for Sitka on the steamer *Queen*, one of the excursion boats plying regularly between Puget Sound and Southern Alaska. The voyage to Sitka furnished an opportunity for seeing the fine glaciers of Tanku Inlet and Glacier Bay, thus serving as an introduction to the still more wonderful ice fields about Mount St. Elias. On arriving at Sitka the members of the expedition were transferred at once to the United States steamer *Pinta*, under command of Captain Farenholt, who had previously received instructions from the Secretary of the Navy to take them to Yakutat Bay. The *Pinta* reached the mouth of Yakutat Bay on June 25th. The bay is a broad, deep inlet, extending more than thirty miles inland, and it was the plan of the expedition to begin work near its head on the west shore. The weather being thick, Captain Farenholt did not think it advisable to take the vessel up the bay, and the voyage had to be made by means of boats and canoes in a driving rain storm. The actual base of operations was reached on June 28th, and the study of the geology and geography of the region began at once.

"When the storm passed away," says Mr. Russell, "we found ourselves on a wild shore encumbered by icebergs and at the immediate base of a majestic mountain range, trending southeast and northwest. Along the southern base of the mountains there is a plateau some

thirty miles broad, divided by the waters of Yakutat Bay. Our task was to explore and map the country from the bay to St. Elias, and as far beyond as practicable. Excursions were begun at once to the neighboring mountains and glaciers and up Yakutat Bay as far as the floating ice would allow a canoe to travel. One of these excursions took us to an island at the head of the bay, which we named Grandview Island. From its summit, which rises boldly a thousand feet above the water, a magnificent view was obtained of a vast stretch of snow-clad mountains from which glaciers of great magnitude descended to the sea and ended in cliffs of ice several hundred feet high. From these the icebergs crowding the bay were derived. One of these glaciers we named after Dalton, the pioneer explorer of the region; another, of larger size, at the head of the bay, was named in honor of Gardner Hubbard, the President of the National Geographic Society. A magnificent mountain peak, rising some 10,000 feet immediately above the Hubbard glacier, received the same name. Another towering peak on the same mountain crest, triangular in shape and always of purest white, was named Mount Seattle in acknowledgment of the faithful services of our camp hands, whose homes are mostly in the 'Queen City of the Sound.'

"While glacial and geological studies were being pushed forward, Mr. Kerr measured a base line with considerable accuracy, and began a map of the region. From the ends of the base line sights were taken to several peaks and hill tops near at hand, the angles between the lines of sight and the base line affording data for determining other distances. By means of angles of elevation their heights could also be calculated. The stations whose position and elevation had thus been determined were made the extremities of new base lines from which sights to all the mountains in the region could be made, and the heights of the highest peaks accurately determined. In addition to the 'dip angles,' the heights of the stations occupied were determined by means of a mercurial barometer. To aid in this work, a 'base barometer' was read three times a day during July and August by Rev. Carl J. Hendrickson, who has charge of a mission at Yakutat. From this beginning the work of mapping the country was carried forward until all the peaks to be seen from our line of march were located and their heights determined. Sketches and photographs were taken from many points of view. These, together with the triangulation, will furnish material for an accurate map of the region visited. The map will embrace upwards of a thousand square miles.

"As soon as topographic work was well under way a line of march towards St. Elias was decided upon. All of our rations, bedding, tents, etc., had to be carried or 'packed' by the men, the character of the country not allowing the use of animals. At first the trips from camp to camp had to be repeated several times. Profiting by experience we abandoned everything that was not essential, and as our work progressed we found that many things deemed indispensable at first could be left behind. Our line of march was toward the northwest, with the triangular summit of St. Elias as our guide. Fortune favored us in many ways. We found passes in the mountains leading in the direction we wished to travel, and no insurmountable difficulties in the way, although great patience and judgment were required in treading the net-work of crevasses in the ice fields. Probably more than nine-tenths of the journey was across glaciers and snow fields.

"On the first of August we were midway between Yakutat Bay and St. Elias, but still at the base of the mountains. Our camp was in the last and highest grove of trees that it was practicable to reach. The timber line is there about 1500 feet high, and all trees disappear a few miles to the west. An island of rock surrounded by vast glaciers, but clothed with beautiful flowers, rank ferns, and dense spruce trees, furnished a delightful spot for our base camp. We named this lovely oasis in the desert of ice 'Blossom Island.' From there our work in the high mountains began. On following up Marvin Glacier, which flows to the west of Blossom Island for about fifteen miles, we reached an elevation of 4000 feet, and found an easy pass, although filled with glacial ice, leading westward across what from a distance seemed an impassable mountain range. We named this 'Pinnacle Pass' on account of the tapering spires overlooking it. West of Pinnacle Pass we descended to a glacier that has its source to the north of Mount Cook, and separates the mountain range from the St. Elias range. On crossing this glacier and approaching the mountain wall which rises to the west of it, we again found a pass leading toward St. Elias that afforded an easy path to the Conrad glacier, one branch of which rises on the northern slope of the great mountain. Following up this branch we at last, after twenty days' hard work above snow line, found ourselves encamped at the base of St. Elias. The weather had been clear for ten days and we had every prospect of a good day's climb on the morrow. Rising at three in the morning we began what we believed to be the final ascent, but, after a few hours, storm clouds settled down around us, snow began to fall and all landmarks were lost to view. The snow continued for thirty hours without cessation, and it

was with difficulty that we found our way through the blinding snow to a lower camp, where the necessary rations were to be had. A second attempt was made to reach the summit two days later, but another snow storm broke over the mountain as suddenly as the first. This time I was alone in the highest camp, where I was imprisoned for six days before being able to rejoin my party below, while Mr. Kerr was similarly isolated at the first camp lower down. When I started down there was six feet of new snow, which refused to harden, and rendered it impossible to do more work among the high peaks.

"On descending to a lower level I started on an excursion up the glacier between the St. Elias range and Mount Cook, which gave promise of leading to a low path across the main range, but a third snow storm coming on, I was obliged to return to Blossom Island and there rejoined Mr. Kerr, who had descended a few days previous. My stay above the snow line lasted thirty-five days. During that time we lived in tents, many times camping on the open glacier, so as to be out of the reach of avalanches. All of our cooking was done by means of small coal oil stoves.

"After returning to Blossom Island an excursion was made far out on the great Piedmont glacier, which forms a plateau about 1500 feet high, stretching along the southern base of St. Elias range. This glacier is of continental type and has an area estimated at about 1000 square miles. It is the largest glacier known in the Northern Hemisphere, with the exception of the ice fields of Greenland.

"We returned to Yakutat Bay about the 20th of September, having had stormy weather almost all the time since leaving the vicinity of St. Elias. On the 22d of September our hearts were gladdened by seeing the *Corwin* steaming up the bay. Captain C. L. Cooper, commander of the *Corwin*, acting on his own judgment and knowing that we would have a hard time if left at Yakutat until winter set in, made the cruise from Sitka especially for our relief, and conveyed the expedition to Port Townsend, where we arrived on October 2.

"From the point of view of the scientist, if not of the Alpinist, our expedition was a success. The plan proposed before starting was carried out almost to the letter, so far as the study of glaciers, geology, and topography was concerned, but we did not reach the top of Mount St. Elias. The measurements made have determined that all the mountains in this region are lower than was previously supposed, and that St. Elias, instead of being the highest point in North America, is in reality a second-rate mountain. Its elevation, instead of being 19,500 as previously considered, is about 13,500. Mount Cook has

an elevation of 10,250, and Vancouver 8,500. Many other peaks in the same region are as elevated as Cook and Vancouver, but St. Elias is higher than any of its immediate neighbors.

"The more important glaciers and mountains in the region explored were named principally in remembrance of distinguished American geologists who are no longer living. One grand mountain, some thirty miles northeast of Elias, and probably only second to it in height, was named in honor of Sir William Logan, formerly Director of the Geological Survey of Canada. Several lofty spires to the east of Mount Logan were named after the vessels of the navy and the revenue marine that have become celebrated for their voyages in Behring Sea and the Arctic Ocean."

The results of the expedition will be presented to the National Geographic Society some time in November, and as soon after as practicable will be published by the Society in the "National Geographic Magazine."—*Philadelphia Ledger.*

GEOLOGY AND PALEONTOLOGY.

The Transitional Drift of a Portion of Northern Iowa.—In a paper by the present writer on "The Glacial Drift and Loess of a Portion of the Northern Central Basin of Iowa," [1] which appeared in the NATURALIST a few months since, there was included in the "Upland Drift" an upper silt-like member.

This member was not at that time recognized as a distinct formation, but upon more recent investigations and study is now apparently demonstrated to be. A description of this, we believe heretofore unrecognized, division constitutes the basis of the present paper.

The area here under consideration includes that portion of Northern Iowa lying east of the double moraine, which enters the State from the north; and west of the Loess belt, which borders the Mississippi on the east. This formation is developed over broad areas of surface; and where best developed and most easily defined the contour of the surface is usually of a subdued undulatory type.

[1] In this paper no allusion was intentionally made (except such as became necessary in speaking of the Valley Drift) to the deposits of the glacial epoch, during which the double moraines were formed. In this paper we considered as subdivisions of the "later glacial epoch" both the Loess and Valley Drift. These two formations are, however now shown to represent a subsequent period. The Valley Drift was derived mostly from the materials composing the double moraines, and the Loess appears to mark the highest stage of water during the occupation of the first moraine.